

Serial No. 10/522,774

H&amp;A-137

Amendment

Responsive to Office Action dated September 17, 2008

**REMARKS****Pending Claims**

Claims 1, 3-9 and 11 are pending. Claims 2 and 10 have been canceled without prejudice or disclaimer. Claims 1 and 3 have been amended. No new matter has been added.

**Claim for Priority**

Applicants respectfully request that the Examiner officially acknowledge the claim for priority of Japanese application No. 2002-204502 and the safe receipt of the certified priority document.

**Claim Objections**

Claims 1 and 3 are objected to for informalities. The claims have been amended to overcome the formalities.

**Claim Rejections Under 35 U.S.C. §§102 & 103**

Claims 1, 4-9 and 11 are rejected under 35 U.S.C. §102(e) as being anticipated by Kitahara, WO03/018972. Claims 1, 10 and 11 are rejected under 35 U.S.C. §102(e) as being anticipated by Deeba, U.S. Patent No. 6,912,847. Claims 2-3 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kitahara, as applied to claim 1 above, in view of Stroia et al, U.S. Patent No. 6,820,414.

Applicants request reconsideration of the rejections in view of the foregoing amendments and for the following reasons. In particular, applicants have amended claims 1 and 11 to include the limitations of claims 2 and 10, which have been canceled without prejudice or disclaimer. As amended, the claims are not anticipated or rendered obvious by

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any of Kitahara, Deeba, or Stroia, whether the references are considered individually or in combination.

In particular, claims 1 and 11 are respectively directed to an exhaust gas purifying apparatus for a diesel engine and a method of purifying exhaust gas of a diesel engine. The apparatus and method include an NO<sub>x</sub> adsorption and reduction type catalyst, a diesel particulate filter and an oxidation catalyst. The arrangement of these elements is shown in Figures 1-5, for example. Referring to the embodiment of Figure 2, the diesel engine 1 having exhaust gas exhausted through exhaust gas channel 2 reaches NO<sub>x</sub> adsorption and reduction type catalyst 6, diesel particulate filter (DPF) 4 and then oxidation catalyst 5 which is arranged downstream of the DPF 4.

The mechanism of NO<sub>x</sub> capture caused by the adsorption of NO<sub>x</sub> and reduction type catalyst 6 results in NO<sub>2</sub> being chemically adsorbed on the surface of an NO<sub>x</sub> adsorbent that is reduced and purified to N<sub>2</sub> using a reducing agent. The chemical adsorption, in which the NO<sub>2</sub> is adsorbed on the surface of an NO<sub>x</sub> adsorbent, is fast with respect to the rate of reduction of the captured NO<sub>2</sub>. This has the advantage of improving fuel economy, for example. See page 14, line 24 to page 15, line 13 of the Specification.

The particulate matter collected by the DPF 4 is burned and removed, i.e. ashed and removed, by allowing an exhaust gas temperature to increase when a fixed amount of the particulate matter (PM) is accumulated. In order to prevent unburned hydrocarbons from being exhausted, the oxidation catalyst 5 is arranged on the downstream side of the DPF 4 with respect to the exhaust gas channel. The oxidation catalyst 5 oxidizes and purifies the CO and unburned HC that are generated by the incomplete combustion of the particulate matter when burned and removed by DPF 4. See page 17, lines 12-15 of the Specification. Further, the oxidation catalyst 5 is not consumed by the NO<sub>x</sub> adsorption and reduction type

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catalyst 6 or the DPF 4 except for the particulate matter combustion, but rather oxidizes and purifies the HC or CO included in the exhaust gas. *See* page 17, lines 16-19 of the Specification.

The exhaust gas purifying apparatus and method for a diesel engine according to the embodiments of the invention allows an NOx catalyst and a diesel particulate filter to be arranged sequentially and to use an NOx adsorption and reduction type catalyst as the NOx catalyst. The speed of the reduction of the captured NO<sub>2</sub> to N<sub>2</sub> is fast and the oxidation catalyst arranged on the downstream side of the exhaust gas channel with respect to the DPF 4 oxidizes and purifies the CO and unburned HC that are generated by the incomplete combustion of the particulate matter collected by the DPF 4.

Kitahara discloses an exhaust gas purification system for a diesel engine that includes an NOx catalyst 13 that traps NOx in the exhaust gas. Further, downstream of the NOx trap catalyst 13 is diesel particulate filter 14 for scavenging particulate matter in the exhaust gas. *See* page 6, line 29 – page 7, line 14 of Kitahara. Kitahara does not disclose an oxidation catalyst arranged downstream of the DPF, although NOx trap catalyst 13 is disclosed by Kitahara as carrying thereon an oxidation catalyst having the function of oxidizing HC and CO in the exhaust gas. Further, Kitahara does not disclose the NOx absorption and reduction type catalyst set forth in claims 1 and 11, as now pending. Accordingly, Kitahara does not disclose or suggest the invention as set forth in claims 1, 3-9 and 11.

Deeba discloses an exhaust gas system for a diesel engine including a low temperature NO<sub>2</sub> trap and a soot filter. However, Deeba does not disclose the NOx adsorption and reduction type catalyst of the embodiments of the invention, and in particular as claimed in claims 1 and 11.

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Stroia discloses a system designed to remove NOx compounds from the exhaust gas stream of a diesel engine. As recognized from the Office Action, Stroia does not disclose the arrangement of the oxidation catalyst downstream of the diesel particulate filter. Rather, Stroia is relied upon for disclosing the oxidation catalyst and the Office Action states that it would be obvious to one having ordinary skill in the art to arrange the oxidation catalyst downstream of the soot filter when the Stroia and Kitahara references are combined.

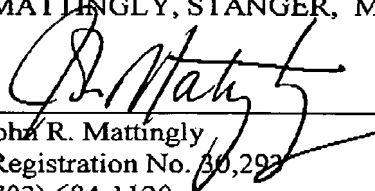
However, Kitahara fails to disclose the limitations of the NOx adsorption and reduction type catalyst set forth in amended claims 1 and 11, and the Stroia reference does not make up for this deficiency. Accordingly, the combination of Kitahara and Stroia, whether or not further considered with Deeba, does not render the invention as set forth in claims 1, 3-9 and 11 unpatentable. Therefore, the rejections under 35 U.S.C. §102(e) and 103(a) should be withdrawn.

**Conclusion**

In view of the foregoing, Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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